effect of curves involving changes of direction of the road, the velocity of the transit, and the distance between the rails; but, for the reason already stated, not comprising the radii of the curves.

Although the radii of the curves do not form a constant element of the estimate of the mechanical power necessary to work the road, nevertheless they are of material consequence, as far as regards the safety of the transit. Although a short curve with a great resistance may be moved over with the same expenditure of mechanical power as a long curve with a long radius, yet, owing to the intensity of the pressure of the flange against the rail, the danger of the trains running off the road is increased: hence, although sharp curves cannot be objected to on the score of loss of power, they are yet highly objectionable on the score of danger.

In the present paper, the author has confined himself to the analytical formulæ expressing various mechanical effects of the most general kind; the coefficients and constants being expressed merely by algebraical symbols: but he states that he has made an extensive series of experiments within the last few years, and has also procured the results of experiments made by others, with a view to determine the mean values of the various constants in the formulæ investigated in this paper. He has also, with the same view, made numerous observations in the ordinary course of transit on railways; and he announces his intention of soon laying before the Society, in another paper, the details of these experiments, and the determination of the mean values of these various constants, without which the present investigation would be attended with little practical knowledge.

A paper was also read, entitled "Register of the State of the Barometer and Thermometer kept at Tunis, during the years 1829, 1830, 1831 and 1832." Presented by Sir Thomas Reade, His Majesty's Agent and Consul General at Tunis. Communicated by P. M. Roget, M.D., Sec. R.S.

The observations here registered are those of the thermometer at 9 A.M., at noon, and at 6 P.M., and the points of the wind, and height of the barometer for each day of the abovementioned years.

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May 5, 1836.

FRANCIS BAILY, Esq., Vice-President and Treasurer, in the Chair.

Edward Burton, Esq., William Sands Cox, Esq., and Captain Thomas Locke Lewis, R.E., were elected Fellows of the Society.

A paper was in part read, entitled "On the Optical Phenomena of certain Crystals." By Henry Fox Talbot, Esq., F.R.S.

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May 12, 1836.

The Rev. WILLIAM WHEWELL, M.A., Vice-President, in the Chair.

The reading of a paper, entitled "On the Optical Phenomena of